DOE/EH-0589

Westinghouse Waste Isolation Pilot Plant:

Report from the DOE Voluntary Protection Program Onsite Reevaluation, *August 3-7, 1998*

U.S. DEPARTMENT OF ENERGY
Office of Environment, Safety and Health
Office of Worker Health and Safety
Office of Occupational Safety and Health Policy
Washington, D.C. 20585

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Foreword

VPP-"The New National Model"

The overwhelming success of the Voluntary Protection Programs (VPP) has been voiced by people at all levels within government, management, and labor over the past sixteen (16) years. The VPP and those people and organizations associated with its success have been the recipients of numerous commendations and awards including multiple "Hammer" awards from the Vice President of the United States.

> ***"The new national model of government regulation is patterned on the successes of programs such as the Voluntary Protection Programs (VPP), which is administered by the Occupational Safety and Health Administration (OSHA) and the Department of Energy (DOE)."***
>
> The White House
> Office of the Vice President
> September 26, 1995

At a White House ceremony in 1995, the Vice President presented two Hammer Awards to recognize the positive impact that VPP had with regard to the National Performance Review (NPR) initiative on reinventing government. The Vice President stated, "It [VPP] is about working in partnership with common goals, instead of as adversaries to protect the safety and health of our workers. It's about focusing a lot less on red tape, and a lot more on results. The Voluntary Protection Programs is the premier example of partnership between government, management and labor."

OSHA-VPP

Since its creation by the Occupational Safety and Health Administration (OSHA) in 1982, VPP has established the credibility of cooperative action among government, industry, and labor to achieve excellence in worker health and safety. As of 1997, there were 394 participants in OSHA-VPP. A variety of major industries are represented in OSHA-VPP, including research and development, construction, utilities, health care, petrochemical, textiles, storage and distribution, wood and paper products, industrial chemicals, and many others.

Injury incident rates for OSHA-VPP participants are 55 percent below the expected average for similar industries. Lost workday incidence (LWDI) rates at participating worksites are 62 percent below the expected average for similar industries and workers' compensation costs showed a 52 percent reduction.

DOE-VPP

The U.S. Department of Energy (DOE) recognizes that true excellence can be encouraged and guided, but not standardized. For this reason, on January 26, 1994, the Department initiated the DOE Voluntary Protection Program (DOE-VPP) to encourage and recognize excellence in occupational safety and health (OSH) protection. This program closely parallels the OSHA-VPP.

DOE-VPP outlines areas where DOE contractors and subcontractors can surpass basic compliance with DOE orders and OSHA standards. The program encourages the "stretch for excellence" through systematic approaches that involve everyone in the contractor or subcontractor workforce at DOE sites. DOE-VPP emphasizes creative solutions through cooperative efforts among managers, employees, and DOE.

DOE-VPP consists of three programs, with names and functions similar to those in OSHA-VPP. These programs are STAR, MERIT, and DEMONSTRATION. The STAR program is the core of DOE-VPP. This program is aimed at truly outstanding protectors of employee safety and health (S&H). The MERIT program is a steppingstone for contractors and subcontractors that have good S&H programs but need additional time and DOE guidance to achieve STAR status. The DEMONSTRATION program is rarely used; it allows DOE to recognize achievements in unusual situations about which DOE needs to

learn more before determining approval requirements for STAR status.

Requirements for DOE-VPP participation are based on comprehensive, integrated management systems where employees are actively involved in assessing, preventing, and controlling potential hazards at the site. DOE-VPP is designed to apply to all contractors in the DOE complex and to encompass production facilities, research and development operations, environmental remediation activities, and various subcontractors and support organizations.

DOE contractors are not required to apply for participation in the DOE-VPP. In keeping with the OSHA-VPP philosophy, *participation is strictly voluntary*. Additionally, any participant may withdraw from the program at any time.

Contractors interested in participating in DOE-VPP evaluate how well their S&H programs implement the DOE-VPP requirements contained in *U.S. Department of Energy Voluntary Protection Program, Part I: Program Elements*. They may decide to submit an application, using *Part III: Application Guidelines*.

The steps of the application review process described in *Part II: Procedures Manual* involve the area office, operations office, and program office to independently assess the application's completeness and the applicant's qualifications for DOE-VPP recognition. Comments from the review are resolved before the application is submitted to the Office of Worker Health and Safety (EH-5).

DOE-VPP staff members may augment the application's information by requesting additional information, visiting the applicant's site, consulting the program office, talking to the applicant's OSHA-VPP outreach partner, or getting input from the applicant's DOE-VPP customer representative.

If the DOE-VPP staff approves the application, an onsite review is scheduled as described in *Part II: Procedures Manual.* Team members are selected based on one or more of the following criteria:

- Is the candidate a subject matter expert appropriate to the site's activities and complexity?
- Does the candidate possess prior VPP experience (DOE and/or OSHA)?
- Does the candidate bring union representation to the team?
- Is the candidate a S&H professional from outside of the Office of Environment, Safety and Health (EH)?
- Is the candidate free of any apparent conflict of interest?

The Onsite Review Team interviews a cross section of employees and management, reviews documents, and makes observations during facility walkthroughs to evaluate the applicant's implementation of DOE-VPP criteria found in *Part IV: Onsite Review Handbook.*

During daily team meetings, Review Team members assess findings, address issues, and seek additional input. At the review's conclusion, the Team presents its recommendation for the level of DOE-VPP recognition to the contractor.

The Team prepares an *Onsite Review Report* that contains the recommendation for recognition, and submits it to the Assistant Secretary for Environment, Safety and Health (EH-1) for approval. The contractor is notified of the Assistant Secretary's decision and, if approved, the DOE-VPP Headquarters office (EH-51, Office of Occupational Safety and Health Policy) arranges to present the DOE-VPP flag to the site.

This report summarizes the Review Team's findings from the reevaluation of Westinghouse Waste Isolation Division (WID) activities at the Waste Isolation Pilot Plant (WIPP) during the week of August 3–7, 1998. It is a milestone in the Department's efforts to encourage the empowerment of employees, and the efforts to change the safety culture in DOE from compliance-driven *re*activity to continuous improvement-driven *pro*activity.

The purpose of this report is to provide EH-1 with an assessment against the DOE-VPP criteria,

together with other information necessary to make the final decision regarding the disposition of Westinghouse WID's recertification of Star designation. Included are synopses of Reevaluation Team findings, and the Team's final recommendation for the site's recertification for Star status. ~

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Abbreviations and Acronyms

ACL—administrative control level

ALARA—as low as reasonably achievable

AR—Action Requests

ASP—Associate Safety Professional

BLS—Bureau of Labor Statistics, U.S. Department of Labor

CAO—Carlsbad Area Office

CAS—Condition Assessment Survey

CAS-CHAMPS—Capital Assets Condition Assessment Survey

CDC—Center for Disease Control, Public Health Service, U.S. Department of Health and Human Services

CH—contact-handled

CHP—Certified Health Physicist

CIH—Certified Industrial Hygienist

CMR—Central Monitoring Room

CPR—cardio-pulmonary resuscitation

CSP—Certified Safety Professional

DAC—derived air concentration

DOE—Department of Energy

DOELAP—Department of Energy Laboratory Accreditation Program

EAP—Employee Assistance Policy

EH—Office of Environment, Safety and Health, U.S. Department of Energy

EMT—Emergency Medical Technician

EPADS—Employee Performance Appraisal and Development System

ES&H—environment, safety and health

FR—Facility Representative

FR—First Requests

FSM—Facility Shift Manager

FTE—full-time equivalent

GET—General Employee Training

HASP—health and safety plan

HR—Office of Human Resources

IH—industrial hygiene

INEEL—Idaho National Engineering and Environmental Laboratory

JHA—job hazard analysis

JSA—job safety analysis

LOTO—lockout/tagout

LWD—lost workday

LWDI—lost workday incidence

MADD—Mothers Against Drunk Drivers

MAST—Management and Supervisor Training

MOIM—Maintenance Operations Instruction Manual

MSDS—material safety data sheet

MSHA—Mine Safety and Health Administration, U.S. Department of Labor

NEPA—National Environmental Policy Act

NIOSH—National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services

NPR—National Performance Review

NRRPT—National Registry of Radiation Protection Technologists

ORPS—Occurrence Reporting and Processing System

ORR—Operational Readiness Review

OSH—occupational safety and health

OSHA—Occupational Safety and Health Administration, U.S. Department of Labor

PIP—Process Improvement Program

POD—Plan of the Day

PPE—personal protective equipment

Pre-Ops—pre-operational check

RCA—root cause analysis

RCM—Radiological Control Manual

RI—recordable injuries

RII—recordable injuries incidence

SAR—Safety Analysis Report

SAT—Systematic Approach to Training

S&H—safety and health

SIC—Standard Industrial Classification

STAR—Systematic Tracking and Reporting System

START—Supervisor Training and Accident Reduction Training

TEAM—Team Employee Appraisal Method

TLD—thermoluminescent dosimeter(s)

TRU—transuranic elements and/or waste materials

TRUPAC—Transuranic Package - container for TRU wastes

TRUPACT—Transuranic Package Transporters

TSR—Technical Safety Requirements

TWA—time-weighted average

VPP—Voluntary Protection Program

WID—Waste Isolation Division (Westinghouse)

WIPP—Waste Isolation Pilot Plant

Executive Summary

The U.S. Department of Energy Voluntary Protection Program (DOE-VPP) Team completed the five-day onsite reevaluation review of the Westinghouse Waste Isolation Division (WID) activities at the Waste Isolation Pilot Plant (WIPP) on August 7, 1998. The Reevaluation Team consisted of 6 members, including a representative from the Oil, Chemical and Atomic Workers Union at Oak Ridge, Tennessee.

The site was reevaluated to validate its success in continuing to implement the five DOE-VPP tenets since their initial recognition as a Star participant in the program. Included in the evaluation were approximately 100 interviews of both staff and management. The Reevaluation Team's summary conclusions for each tenet follow:

ì **Management Commitment**—An extremely high level of management commitment continues to be demonstrated at WIPP. This commitment was also confirmed by the employees who were interviewed. Management is visibly involved in the safety and health (S&H) program, most notably through regular walkaround visits that are performed as part of the Landlord Program. Under this program, line managers are designated as "landlords" for a portion of the site and they are responsible and held accountable for ensuring that their areas are in a state of good repair and free of hazards. The site has a S&H policy which clearly states that safety is the top priority. It was clear from the employee interviews that all levels of personnel understand this priority at the site. The site's management commitment to excellence in S&H was highly visible to the Reevaluation Team.

í **Employee Involvement**—Employee involvement at the WIPP site continues to be outstanding. Employees interviewed expressed a sense of ownership for the site and for the S&H program. Employees feel responsible for their safety and that of their peers. During the interviews, a great deal of pride was observed. They used the term "we" and spoke of "our" efforts and successes. One interviewee stated that "it is not the safety program that keeps us safe - it is us taking care of each other." The employees were candid and cooperated fully with the Reevaluation Team. Employees indicated that they had no fear of reprisal for relaying safety concerns to management. Employees recounted instances where they had stopped work during situations they believed to be unsafe, and pointed out that they have never been reprimanded for doing so; in fact, management assisted employees in resolving their concerns. Employees felt that management was truly concerned about their well-being. Employees felt empowered to immediately correct a hazardous situation or bring the condition to management's attention. The Reevaluation Team found a healthy sense of employee ownership and pride in S&H at the Westinghouse WIPP site.

Recently, the site's hourly workers (about 135 out of 600) voted to authorize the Oil, Chemical and Atomic Workers Union to represent them in bargaining agreements. At the time of the DOE-VPP reevaluation, the union officers had not yet been elected nor had contract negotiations begun. When employees were asked what impact the collective bargaining unit would have on S&H, they unanimously responded that no adverse impact was expected. They further expressed that the collective bargaining unit will support DOE-VPP participation. Employees who were active in the efforts to authorize a collective bargaining agent were among those interviewed.

î **Worksite Analysis**—Worksite analysis at WIPP was found be thorough and comprehensive. Extensive programs continue to be in place to identify hazards in new or modified processes as well as in existing processes. Comprehensive surveys performed by the site staff and by expert consultants are exhaustive and well documented. Items requiring correction were tracked to completion. All WIPP work spaces are listed and surveyed annually. Westinghouse conducts a continuous comprehensive survey which they call the Condition Assessment Survey (CAS). The personnel who conduct the surveys, referred to as

inspectors, consist of staff who are (1) dedicated to the CAS program, (2) representatives of the landlord for that space, and (3) S&H professionals.

Interviewed employees verified that safety-related work requests are given top priority, and that correction of hazards is always timely, if not immediate. Employees are specifically involved in worksite analysis through their development of both procedures and job hazard analyses (JHA). The Reevaluation Team noted many instances where the employees were also involved in hazard correction.

ï **Hazard Prevention and Control**—Management, S&H staff, and workers at the WIPP site have aggressively focused on preventing and eliminating hazards. A comprehensive program exists at the site to eliminate the unnecessary use of toxic/hazardous chemicals. There is considerable evidence that a hierarchy of controls is being utilized throughout the WIPP site which includes the substitution of less hazardous materials, such as water-based paint for solvent-based paints and detergents for solvent-based cleaners, to implementation of engineering controls where needed.

The WIPP site places considerable emphasis on professional certification and experience for its S&H staff. A variety of professional expertise is available onsite for consultation on resolution of safety issues. Safety and industrial hygiene staffing consists of four safety professionals and one industrial hygienist. In addition, Westinghouse WID has access to corporate expertise in several disciplines including risk assessment, safety analysis, industrial hygiene, and others on an "as needed" basis.

ð **Safety and Health Training**—Westinghouse WID has an exceptional S&H training program at WIPP that has been in place for more than eight years. The Training Department has a staff dedicated to training employees, and training professionals conduct training on a daily basis. The training staff was found to be highly skilled and motivated. Training consists of a combination of classroom and on-the-job training as it applies to the various positions. Site employees reported that safety training helps them understand the potential hazards of their job and ways to protect themselves. The training programs were initially established and continue to be in place to ensure that Westinghouse WID personnel are qualified to perform their job requirements safely. Employees were observed properly using personal protective equipment (PPE), and when questioned, were knowledgeable about its limitations and care. The employees also explained in detail what their responsibilities and actions would be for different types of emergencies at the site. In addition, managers and supervisors are required to complete 21 modules of the Management and Supervisor Training (MAST) Program, of which MAST 123 covers industrial safety. Top management fully supports the training program, as evidenced by employee and supervisor interviews, training funding levels, and their active review and approval of training materials.

Recommendation

Based on information and insight obtained during the onsite visit, the Reevaluation Team unanimously voted to recommend the Westinghouse WID at WIPP for continuation of STAR status under the DOE-VPP. ~

I. Introduction

The Westinghouse Waste Isolation Division (WID) Department of Energy Voluntary Protection Program (DOE-VPP) onsite reevaluation was conducted August 3–7, 1998, at the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico. The Reevaluation Team was composed of 6 members, including a bargaining unit representative. The names of the Reevaluation Team members can be found in the Appendix to this report. During the course of the review, the Reevaluation Team conducted over 100 formal and informal interviews, reviewed several documents, and conducted walkthroughs of the site.

This site was the first to receive Star designation under the DOE-VPP and the first to undergo reevaluation. The primary purpose of the reevaluation visit was to confirm that Star-level quality of the Occupational Safety and Health (OSH) program was being maintained at WIPP by Westinghouse WID.

WIPP is a U.S. Department of Energy (DOE) facility, operated under contract by Westinghouse Electric Corporation. It is designed to demonstrate the safe handling, transportation, and disposal of transuranic waste in deep salt beds. The deep-bedded salt formation where WIPP is located has been geologically stable for more than 225 million years. Stationed at the site are some 860 employees. Of these, 610 are employed by Westinghouse Electric Corporation, 45 by DOE, 46 by Sandia National Laboratories, and 147 by subcontractors.

Under Public Law 96-164, the U.S. Congress mandated the construction and development of WIPP as a research and development project. The facility will dispose of transuranic wastes exclusively, not commercial or high-level wastes. Transuranic wastes are those containing or contaminated with radioactive elements heavier than uranium. Most of the waste consists of contaminated laboratory gloves, tools, dried sludges, and other material discarded from laboratory or production facilities.

The site is located about 26 miles east of Carlsbad, NM. Construction of the facility began in 1979. The site is comprised of three types of facilities:

- assorted surface buildings,
- four vertical shafts, each 2,150 feet (655 m) deep, and
- a 7.2-mile (11.6 km) underground network of horizontal storage rooms, alcoves, and tunnels.

The surface buildings house the site personnel and equipment needed for WIPP operations and research activities. The vertical shafts connect the surface facilities to the underground; in this way, it will be possible to move transuranic waste to its underground destination.

The site is slated to receive defense-generated transuranic wastes from DOE facilities throughout the complex. Once WIPP is fully operational, defense facilities will ship waste directly to the facility. Presently, transuranic wastes are stored in sealed containers above ground at sites such as the Idaho National Engineering and Environmental Laboratory (INEEL) in Idaho Falls, Idaho.

WIPP was expected to begin receiving wastes in June 1998. However, because the State of New Mexico's Environmental Department requested additional information regarding the characterization of the contents of waste, DOE delayed the facility's opening until such information could be provided to the State of New Mexico. Until such wastes are received, the predominant activity at WIPP is mine maintenance; the aim is to prevent the site from undergoing subsidence and, as a consequence, premature closure.

II. Quantifiable Program Results

Westinghouse WID's procedure, WP 12-SA3130, provides instructions for reporting occupational injuries and illnesses. It provides the necessary guidance for decision making with respect to the proper recordability of occupational injury and/or illness cases consistent with the Occupational Safety and Health Administration's (OSHA) Recordkeeping Guidelines. The Reevaluation Team reviewed OSHA 200 logs for the current year as well as the preceding three calendar years. To calculate the lost workday incidence (LWDI) and recordable injury incidence (RII) rates, the Reevaluation Team used two standard formulas:

$$\text{RII rate} = \frac{\text{No. of recordable incidents [Col.(1) + Col.(2) + Col.(6)] x 200,000}}{\text{No. of employee hours worked}}$$

$$\text{and LWDI rate} = \frac{\text{No. of LWD cases [Col.(2)] x 200,000}}{\text{No. of employee hours worked}}$$

The following table provides the data and rates for the preceding three calendar years, together with the three-year average. It also provides the Bureau of Labor Statistics (BLS) National Average Rates for the Standard Industrial Classification (SIC) code of 4953.

Injury and Illness Data and Rates at WIPP

Calendar Year	LWD Injury Cases	RII Cases	Employee-Hours Worked	LWDI Rate	RII Rate
1995	0	5	1,369,568	0.0	0.73
1996	6	12	1,347,775	0.9	1.93
1997	6	10	1,318,031	0.9	1.51
3-Year Average				0.6	1.38
BLS Average for SIC 4953				6.9	12.60

Since the WIPP site's mission is to safely dispose of transuranic waste, the site is classified with a SIC code of 4953, which denotes refuse systems.

The 3-year average rate for both RII and LWDI is substantially below the industry average published by BLS and far exceeds the DOE-VPP requirements for Star designation. These rate calculations include both WIPP and temporary workers. The increase in the 1996 rates from the 1995 rates resulted from minor injuries that had no particular trends. However, such an increase did not continue in the following years due to awareness efforts put forth both by management and employees. The information entered on the OSHA 200 log supports the information submitted in the application and contained in the supporting injury/illness documents. The person responsible for maintaining the log has attended training courses on the recordability of occupational injury and illnesses offered by DOE on two occasions. This individual was found to be knowledgeable on the OSHA 200 log requirements. The Safety Department generates an injury/illness trending report on a monthly basis, which is distributed to managers as a tool for use in their efforts to reduce injury rates. ~

III. Management Leadership

A. Commitment

Westinghouse management continues to demonstrate commitment to occupational safety and health (OSH) at WIPP. Westinghouse WID's management policy MP1.12, *Worker Protection Policy*, clearly indicates that the protection of environment, safety and health (ES&H) is the top priority in conducting operations at WIPP. Management commitment to safety at WIPP is demonstrated on a continual basis. For example, safety-related topics are communicated to all employees through weekly news articles in WID's *TRU NEWS*. Another example of management commitment is the recent revision of the safety policy statement to a more clear and easily understood document. From the employee interviews, it was determined that all levels of employees understand that safety is the top priority at the site.

Westinghouse management is very supportive of employee participation in the S&H program. Time is allocated for individuals to serve on various committees and teams, such as the Safety Awareness Team, Site Safety Committee, Emergency Response Team, and Mine Rescue Team. Employees are also encouraged to participate in the WIPP safety fair and other DOE-VPP related activities. The Reevaluation Team interviewed managers at various levels and it was clear to the Team that WIPP management is committed to safety. Management's goal to maintain Star-quality S&H programs, the individual safety objectives set to reach that goal, and the integration of OSH into all management planning also demonstrate Westinghouse management's commitment to safety. The Reevaluation Team noted two areas of improvement and made the following recommendations related to safety objectives to enhance management commitment.

Recommendations

(1) Provide and implement a formal system to communicate the S&H goal and the annual safety objectives for the site to all employees so that they can understand their roles to achieve them.

(2) Evaluate the recommendations from the annual program evaluation to determine which, if any, should be included as annual S&H objectives.

> "It's not the safety program that keeps us safe—it is us taking care of each other."

B. Written Program

All elements of DOE-VPP, including management leadership, employee involvement, worksite analysis, hazard prevention and control, and S&H training, are part of a written S&H program. Westinghouse WID's Management Policy MP1.12 was recently revised in March 1998, to incorporate DOE-VPP elements and sub-elements. The recently printed Employee VPP Handbook also covers the basic tenets and sub-tenets of DOE-VPP.

C. Responsibility

Westinghouse WID's Management Policy MP 1.29 ensures that all personnel understand their authority, responsibilities, and accountability with regard to safety at WIPP. All employees are held accountable for their safety performance, and the annual job performance appraisal system includes individual safety objectives. Responsibilities are further defined in the Management and Supervisor Training (MAST) Program (the MAST-123 document), which all managers and supervisors must complete. The document also reinforces the site's philosophy that safety is the top priority. This philosophy was confirmed through interviews with several personnel representing various levels of management and non-exempt employees. As one employee stated in an interview, "it's not the safety program that keeps us safe – it is us taking care of each other." This is an example of the

attitude that safety is everyone's responsibility. Every manager interviewed knew the types of injuries that had occurred in their respective departments this year, and knew their safety performance for the year. The managers know that they are responsible for and will be held accountable for the safety of their employees.

It was very clear from the management and employee interviews that safety is everyone's responsibility at WIPP. For example, one employee interviewed said [referring to her small group], "if one has a safety issue, it becomes everyone's issue. We all try to resolve it as a group." As a result of Westinghouse's recent annual program evaluation, management began modifying job descriptions of all personnel to include safety responsibilities. At Westinghouse WID, S&H professionals continue to be used as resources by the line. These individuals lend technical expertise on an as-needed basis while providing guidance, policies, and procedures.

D. Authority and Resources

The authority to shut down operations or equipment, if found to be unsafe, is set forth in Westinghouse WID policy MP 1.12 Rev.3. The language in the policy states that all personnel will "identify unsafe conditions and actual or potential imminent danger situations and stop/refuse work until the condition is corrected." As evidenced though employee interviews, the Reevaluation Team found that employees are authorized to shut down a piece of equipment, or an operation, that they believe to be unsafe. Several of those interviewed had invoked their stop work authority and none had received negative feedback as a result. As a testimony to their authority to shut down a job felt to be unsafe, one employee stated that, "If I am concerned about safety, I can stop anyone's work, even the site manager's" [referring to the site manager by his name]. Workers interviewed clearly believe that safety concerns get high priority reaction and response. One worker said, "Nothing is postponed. If you see a safety problem, it is taken care of." The Reevaluation Team found that, since the initial evaluation and Star approval, Westinghouse management at WIPP has not diminished or changed their position in authorizing employees to shut down operations that are deemed to be unsafe.

Since safety is an integral part of all Westinghouse WID processes at WIPP, a budget for safety is integrated into their overall processes and operations. The Reevaluation Team observed several instances of management's commitment to provide resources for OSH. Westinghouse management provides its organizations with enough workers, and adequate training and equipment to fulfill their responsibilities. This was evidenced by the adequate level of staffing and the provision of adequate personal protective equipment (PPE), the absence of equipment maintenance backlogs, and the extensive training provided. For example, WIPP has 18 full-time equivalents (FTE) for industrial safety and hygiene, and health services, in addition to subcontracts for nursing services. Provision of resources for geotechnical monitoring and ground control to prevent entrapment of miners is another example of Westinghouse management's commitment to providing resources for worker S&H. Additionally, contract workers are allowed to attend safety-related meetings with no deductions in their wages and salaries. Employee interviews confirmed that they have never encountered situations where their S&H concerns were not addressed for want of resources or funding.

E. Line Accountability

Safety accountability of Westinghouse WID personnel is accomplished annually, through performance measurements of S&H objectives that have been mutually agreed upon by the employee and his or her supervisor or manager. Management Policy MP 1.21, *Management Responsibility and Accountability*, states that managers must fully understand their responsibilities and they will be held accountable for the activities conducted and decisions made within their areas of cognizance.

Until last year, employees were evaluated under the Employee Performance Appraisal & Development System (EPADS). At present, Westinghouse WID personnel are assessed under

a performance appraisal process known as the Team Employee Appraisal Method (TEAM). The TEAM process was developed by a group of individuals comprised of non-exempt, exempt, and management personnel.

At the beginning of each year, each employee establishes job performance and developmental objectives. Safety is one of 6 objectives that are set forth in each performance plan. The employee and manager agree upon these objectives and assign a performance value to each one based upon the importance and priority of each objective. If the employee and manager decide that safety represents a critical component of the employee's performance, the performance values are assigned accordingly. They also determine the customer base and choose those persons from whom performance feedback is desired. At the end of the rating period, the manager solicits input from the employee's customers. An average score of each performance attribute is calculated. Making safety an integral part of each element's score is a key part of ensuring accountability at Westinghouse WIPP.

Each customer feedback input rating ranges from 1 to 5, with 5 being the highest rating. The average of all customer input, or Customer Satisfaction Index, for each attribute is calculated. Overall performance is calculated by taking the average of the two performance categories: (1) total performance rating determined by the manager (a maximum of 5 can be achieved) and (2) the average Customer Satisfaction Index rating provided by the customers. Safety, as one of the attributes, accounts for an equal percent of the overall score. For other achievements, additional points (up to 0.5) can be given by the rating official. By applying a 360-degree approach and seeking input from the customers, Westinghouse WID ensures that a meaningful assessment of performance and accountability occurs.

F. Visible Management Involvement

The Reevaluation Team observed a continuation of strong, highly visible management leadership with respect to S&H at WIPP. Westinghouse top management is highly visible to exempt and non-exempt employees in demonstrating their commitment to and leadership in the S&H program. Top management participates in quarterly all-employee meetings. Management's involvement was verified through document review and the Reevaluation Team's formal and informal interviews with management and the site and subcontractor employees. Employees affirmed that management exhibits a strong presence in both surface facilities and underground.

The S&H of all site employees and the public have been the top priority at Westinghouse WIPP. A primary mandate conveyed by all levels of Westinghouse management to employees is that work will stop immediately if any job is unsafe. Senior managers, line managers, and first-line supervisors are visibly involved in S&H, most notably through participation in scheduled landlord inspections. Additionally, their visibility is demonstrated by their participation in the Executive Safety Council. During the evaluation, the Reevaluation Team interviewed upper-level and mid-level managers and first-line supervisors and observed many programs demonstrating visible involvement and commitment to S&H. Other examples of visible management involvement include:

Roundtable Meetings—Senior managers hold roundtable sessions with their employees, which encourage employee interaction and discussion with management in informal settings. Meetings are composed of a manager and small groups of employees discussing issues raised by employees including safety, and area-specific processes. All employees within their departments are welcome to attend these meetings. The roundtable meetings are one example that demonstrates how S&H communication flows both ways between management and employees.

WID's Open Door Policy—WID's management encourages open and honest communication, and uses several avenues for communicating this open door policy such as simply telling the employees of the policy, as well as distributing memorandums and inclusion of a statement about the open door

policy in the Employee Handbook. The policy serves as an example of senior management's accessibility. Employee interviews provided positive feedback with regard to access to top management.

WID's TRU Newspaper—The *TRU News* showcases a safety article in every publication and has been in weekly circulation for many years.

G. Site Orientation

All persons going into contractor-controlled spaces at the site receive appropriate site orientation. Security procedures ensure that all persons entering the site either receive the orientation training or show evidence of site orientation training within the last year. The Reevaluation Team received the one-half hour site orientation video [General Employee Training (GET)] and received a card, which they had to produce whenever entering the site. Entry and exit from the site is adequately controlled by Security.

The site practices strict personnel accountability to assure that all personnel are accounted for in case of an evacuation. The Reevaluation Team found that visitor safety is well covered by the current evacuation procedures. The site however, felt that non-DOE visitors may not be sufficiently knowledgeable of these procedures to feel comfortable about what they should do in case of an evacuation. Accordingly, Westinghouse WIPP is reviewing the site orientation sections that inform visitors of emergency preparedness procedures (see Section VI.F).

H. Subcontractor Programs

Subcontractors performing work at WIPP fall under two categories: construction subcontractors where the Davis Bacon Act applies, and maintenance subcontractors and consultants. Davis Bacon Act contractors must submit a safety plan as part of the selection criteria. Components of the plan include the company's safety policy and program responsibilities (workers' compensation coverage, safety administrator's qualification, OSHA Form 200). The subcontractor selection process includes an in-depth screening of their health and safety plans (HASPs), job hazard analyses (JHAs), safety training, and OSHA 200 injury and illness logs. Contractors selected to do work must have these plans approved by the Industrial Safety and Health Section and must accept WID's safety requirements. However, the Reevaluation Team noted that the procurement process for contractor selection does not place a higher weight on safety. Maintenance contract work at WIPP is performed by a subcontractor who has been performing maintenance work at WIPP for the past 8 years. Safety was taken into consideration at the time of the initial selection. WIPP management decided to continue the maintenance contract with this particular contractor because of it's excellent safety record. The maintenance subcontractor has a full-time safety administrator who is assigned to oversee the safety of all jobs performed at WIPP. The subcontractors that were interviewed recognized that their S&H performance was important to the selection process and to their continued tenure at WIPP.

Subcontractor workers adhere to the same S&H rules that apply to Westinghouse WID employees. Each contractor is given "General Safety & Security Rules for Contractors," which details the S&H requirements such as electrical, scaffolding, and walking and working surface requirements. At WIPP, a project engineer is assigned for each construction job. Project engineers conduct walkthroughs of the site daily. The project engineers undergo several safety training sessions including 40-hour training in recognizing OSH hazards, electrical safety, first-aid, lockout/tagout, and compressed gas cylinder storage and usage. In addition, the Industrial Safety Department oversees all subcontractor operations. DOE personnel also conduct periodic walkthroughs of the construction projects. The safety office periodically audits the work areas, documenting discrepancies on a standard form. Usually these discrepancies are corrected expeditiously or mitigated by the appropriate subcontractor. Discrepancies that are not corrected immediately are entered onto the site's hazard abatement listing. If the need arises, work can be stopped by any employee, including a subcontractor. The

Industrial Safety Department also requires subcontractors to complete their own self-audits.

Subcontractor injuries and illnesses are reported to the medical clinic. The Industrial Safety Office maintains OSHA Form 101s (First Report of Injury) for inspection by the site technical representatives. The subcontractor rates for the preceding 3 years are also maintained in the office.

Based on the review of subcontractor programs, the Reevaluation Team made the following recommendation to enhance the selection process.

Recommendation

It is the recommendation of the DOE-VPP Reevaluation Team that Westinghouse WID evaluate the procurement process to determine if the safety points allotted for construction subcontractor selection can be increased.

I. Annual Self-Evaluation

Westinghouse WID conducted a comprehensive and thorough program evaluation that met DOE-VPP requirements. The evaluation for 1997 was conducted by a group of individuals that included members from the Westinghouse corporate office. The report for the annual evaluation conducted in 1997 covers all of the required elements and sub-elements, with two minor exceptions from a sub-element: trend analysis for hazards found through self-inspections and employee reports of hazards. The report provides a concise evaluation of the requirements and avoids the common pitfall of simply describing aspects of the program. The evaluation resulted in a large number of recommendations that the site responded to with assignments and due dates. Most of the recommendations have been implemented to continuously improve the program; the rest are in progress with implementation due dates later this year.

The written system for the annual self-evaluation was finalized while the Reevaluation Team was onsite. The annual evaluation is tied into procedures for other site self-assessments but has its own requirements laid out. The site prefers to have flexibility as to who will perform the evaluation each year and when it will be done. The site has had good results from asking the Westinghouse corporate safety staff to take charge of the evaluation, as was done in 1997.

The new system refers generally to taking evaluation report recommendations for structural or budget changes to the General Manager's office. The system provides for follow-up and tracking of all accepted recommendations from the evaluation reports.

IV. Employee Involvement

The Reevaluation Team observed that employees continue to be strongly involved in WIPP's S&H program. Employees feel responsible for their safety and that of their peers. They used the term "we" and spoke of "our" efforts and successes. A great deal of pride was shown. One interviewee stated that "it is not the safety program that keeps us safe - it is us taking care of each other." The Team found a healthy sense of ownership and pride in S&H at the WIPP site.

Westinghouse management was very helpful in providing access to employees for formal interviews. In addition, the Reevaluation Team was free to walk anywhere above ground and interview employees informally. Informal interviews below ground were also easy to achieve. The atmosphere for interviewing employees was very positive. During these interviews, the Reevaluation Team received positive feedback regarding employee involvement. All individuals knew of their authority to stop work if they believed that unsafe conditions existed. Several of the interviewed individuals had invoked their stop work authority and none had received negative feedback as a result. Examples of employee statements during interviews are provided below:

"Impressive, I never worked at a place like this."

"Safety and health is not just a program, it is just the way it is. Safety and health is ingrained in day to day activities."

"WIPP has the best safety and health program you will ever see."

"I never knew of anyone being faulted for being too safe."

"WIPP is the safest place I ever worked."

The site's hourly workers (about 135 out of 600) recently voted to authorize the Oil, Chemical and Atomic Workers Union, AFL-CIO, to represent them in bargaining agreements. At the time of this reevaluation, the union officers had not yet been elected nor had contract negotiations begun. Interviewed employees who were asked what impact the collective bargaining unit would have on S&H unanimously responded that no adverse impact is expected. They further believe that the collective bargaining unit will certainly support DOE-VPP participation. Employees who were active in efforts to authorize a collective bargaining agent were among those interviewed.

"Safety and health is ingrained in day to day activities."

Employee knowledge about S&H activities and about their own S&H protection was generally quite good; even office workers spoke of reminding each other about housekeeping methods to prevent hazards. All employees have the right to stop any activity on the site if they feel that it might be unsafe. Many of the employees interviewed said that they had done so several times. One employee said he felt free to stop the General Manager if he thought it was necessary.

Nearly all the employees interviewed described the site as the safest place they had ever worked. One interviewee said that WIPP is the safest place to work in the whole area. Another remarked, "We just don't get hurt here on the job." An office worker said that "safety is our way of work. If you aren't safe, you don't work here." One or two employees felt that the concern for safety at the site was almost "overboard." One long time worker said that the

only way to be any safer would be to do absolutely nothing. Another stated that during the 12 years he had worked at the site there has been a "hell of an evolution in the safety culture. People may have said that safety was number one, but now it really is!" These employee views of safety at WIPP matched the impressions of the DOE-VPP Reevaluation Team.

In addition to the safety committees described below, employees mentioned being involved in safe work planning and accident investigations. Zone 3 is using integrated planning for major projects which involves having engineers, safety (including industrial hygiene and/or radiation experts when appropriate), as well as the workers who will carry out the project, involved in project planning. One hoist operator told the DOE-VPP Team that this integrated planning had made a big difference in putting new tensioners on the hoist. This is a big job which "normally" takes eight days. With integrated planning, it was accomplished smoothly and safely in three days. It was clear that this hourly worker was both impressed and proud.

At WIPP, the non-exempt worker population (the approximately 135 employees now represented by a collective bargaining unit) makes up only 29.3 percent of the whole employee population. There are also many non-managerial staff jobs which are exempt. Workers of both categories are dispersed within the many committees that deal with health and safety related issues. Non-management employees, whether exempt or non-exempt, make up the majority of committee members. One committee is made up of all non-managerial employees with a non-exempt Chairperson.

The Executive Safety Council was organized to oversee the safety program and ensure its effectiveness, and is definitely involved with the "structure and operation" of the S&H program. It has only DOE (a DOE manager chairs the council) and Westinghouse managers as voting members but plans to add a representative of the collective bargaining unit as a voting member. There are a number of non-managerial employees, including some non-exempt employees, who meet consistently with this committee to report on various committee activities or other S&H aspects. Although the Council is set up with only a few voting members, most meetings do not involve any voting. The safety of DOE employees located in Carlsbad (along with some exempt Westinghouse employees) is also overseen by this committee.

The Operations Safety and Communications Committee is 100 percent non-management, 60 percent non-exempt, and is chaired by a non-exempt employee. The purpose of this committee is to address questions and concerns of Operations personnel in an open forum which any employee may attend. Formal membership lasts for a staggered six-month rotation of each section Chair. Committee minutes cover a wide range of safety and hygiene concerns and resolutions, including concerns for underground touring guests.

The ALARA (as low as reasonably achievable) Committee has oversight for facility activities and techniques to minimize exposures to ionizing radiation. Currently, with the exception of instrument calibration sources, there are no potential exposures to radiation but the site has all its procedures in place and regularly conducts drills for receiving radioactive waste. The committee has two non-exempt workers and several exempt but non-managerial employees as members.

The Lessons Learned Committee collects information from government, industry, and WIPP experiences "to promote the occurrence of desirable activities or to preclude the reoccurrence of undesirable activities." It is made up of representatives of the major departments and currently has no non-exempt members, although it does have non-managerial exempt members. This committee has been successful in communicating lessons learned to employees as demonstrated by the number of interviewed employees who could describe them.

The Safety Awareness Committee which oversees all WIPP S&H awareness activities is comprised of about half exempt and half non-exempt employees, and the majority are non-managerial employees. This committee is involved in all aspects of safety awareness including offsite

safety for the family and the community. It has coordinated events with outside groups, such as Mothers Against Drunk Drivers (MADD) and the Carlsbad Fire Department. The committee is also responsible for the *TRU-News* and the *Porcelain Press*. (This newsletter is provided in the bathrooms at the site.)

The Surface Management Council coordinates and maintains the Landlord Program and all surface facility safety issues. Every part of the site has a landlord who is ultimately responsible for it's condition. This committee is chaired by a manager of an Operations section and co-chaired by a non-exempt representative. The site landlords are about half managerial and half non-managerial employees.

The Electrical Safety Committee acts as a technical resource for identifying, communicating, and recommending resolution of electrical safety issues. The Chair is a manager and at the time of the DOE-VPP onsite reevaluation, there were nine exempt and four non-exempt members on the committee. While the DOE-VPP Team was onsite, another non-exempt employee joined the committee.

These committees, particularly the Operations Safety and Communications Committee and the Safety Awareness Committee, were mentioned by interviewed employees. Their view of effectiveness matched that of the DOE-VPP Team. Employee involvement and ownership remain strong at Westinghouse WIPP and should not experience any adverse effects from the organization of a collective bargaining unit for non-exempt employees.

In light of the forthcoming establishment of a collective bargaining unit, the Reevaluation Team made a recommendation to enhance committee membership.

Recommendation

It is the Reevaluation Team's recommendation that Westinghouse WID revise the Executive Safety Council Charter to include a voting member appointed by the collective bargaining unit after the union election. This addition of a non-management exempt employee can be implemented through means such as rotation. In addition, other safety-related committee charters should be revised to ensure that the collective bargaining unit is represented on each committee. ~

V. Worksite Analysis

High levels of management commitment and employee involvement have helped to ensure continued comprehensive and thorough worksite analyses at WIPP. Pre-startup reviews, hazard analyses, and various comprehensive reviews are well documented. All corrective actions are tracked closely until completion. The Conditions Assessment Survey (CAS) is a continuous comprehensive survey of the WIPP site, and the CAS inspectors are a team consisting of CAS staff, landlord representatives, and S&H professionals.

Practically all of the interviewed employees said that WIPP is one of the safest places to work, and that requested safety-related work is always given top priority. Employees also appreciated that they were routinely involved in developing job procedures, JHAs, and even corrective actions.

> "...safety is our way of working...if you aren't safe, you don't work here..."

A. Pre-Use, Pre-Startup Analysis

Workers are involved in pre-startup job planning and hazard assessments, and are aware of and use the Westinghouse Procedure, WP 04-AD3001, which establishes the checklists and instructions for verification of compliance with technical safety requirements (TSRs) for mode compliance equipment and personnel staffing before entering each operational mode. Workers also use individual JHA methods, which include a job safety analysis (JSA) worksheet. Westinghouse WID also uses Operational Readiness Reviews (ORR) as a mechanism to ensure operations can be performed safely. For example, in January 1998, Westinghouse WID performed a New Start ORR for activities associated with emplacement of contact-handled (CH) transuranic (TRU) and TRU mixed waste disposal operations. The results of the ORR indicated that waste emplacement operations could be safely performed upon correction of pre-start findings.

The Reevaluation Team verified that changes and modifications of equipment continue to be introduced into WIPP through:

- the engineering design change process, and
- the routine maintenance of plant systems and equipment.

New systems and equipment planned for installation at the WIPP site are designed in accordance with the WIPP Safety Manual, Chapter 1, Section 12.7, Design and Design Review. The process involves the following:

1. Engineering change proposal. The process begins with an engineering change proposal that defines the conceptual design features of the proposed system or equipment. At this stage, the design engineer and the cognizant design manager determine the impact level of the design, and the manager prepares a Design Review Plan. Impact levels determine how much scrutiny and rigor will be applied to the design. Impact levels range from impact level I assigned to the most complex and important designs to impact level IV assigned to systems or equipment of minor importance.

2. Design. For system designs that have been assigned a lower impact level (III or IV), the Design Review Plan may apply a graded design review approach by conducting an independent review that is formally documented.

For system and equipment designs assigned impact level I or II, the design process is formal and rigorous. After completing conceptual design, as specified in the Design Review Plan, WID Engineering may conduct a conceptual or preliminary design review that includes review by engineers from the following organizations:

- ES&H (including fire protection),
- Regulatory Compliance,

- Waste Handling Operations,
- Radiological Safety,
- Industrial Safety,
- Other Engineering Disciplines, and
- National Environmental Policy Act (NEPA) Designated Staff.

3. Comments. Comments are formally received and dispositioned as the final design is prepared.

4. Final design review. When the design is 90 percent complete, a formal final design review is conducted, as specified in the Design Review Plan. All of the applicable reviewers who helped review the conceptual design return to participate. As a part of this review, Westinghouse WID uses a Design Review Checklist. As its name suggests, the checklist systematically helps ensure that reviewers address all aspects of the design. The checklist includes sections on environmental protection, industrial safety, process safety, and Safety Analysis Report (SAR) impacts. As was done during the conceptual design review, formal comments are received and formally dispositioned before the system is constructed or installed.

5. System turnover package. Once the system is fabricated or built and startup testing is complete, Westinghouse WID Engineering prepares a system turnover package for operations. The system turnover package is an engineering evaluation confirming that all of the people, parts, and procedures are in place and ready for use by operations. The review includes an individual review of operator training, spare parts, as well as field verification of procedures.

Interviews with managers and first line workers, as well as document reviews, validated that this process is understood and routinely used.

Readiness for safe operation within the specified controls, including personnel readiness, is verified prior to work initiation by a number of mechanisms including:

- Operator participation in pre-job briefings, review of shift turnover reports, and implementation of procedures;
- Supervisor or line manager participation in pre-job briefings, review of the turnover status sheets, and verification and approval of the Mode Compliance Check List;
- Validation and implementation of procedures by technical personnel;
- Attendance at Plan of the Day (POD) meetings by representatives from all WID departments;
- Craft personnel review of the safety professionals' input prior to starting work;
- Participation in POD meetings, review of Work Orders, and monitoring of construction work activities by ES&H support personnel.

B. Comprehensive Surveys

Baseline surveys are a critical component of an effective S&H program at WIPP. The scope of hazardous work authorized for WIPP is formally documented in Statements of Work and Work Authorization Directives pertaining to the contract. Westinghouse also maintains an authorization basis (DOE/WIPP 95-2065) as part of its SAR. The Reevaluation Team verified both documentation and effective utilization of the many comprehensive surveys that are routinely conducted at WIPP, which provide a system of checks and balances to ensure safety and regulatory compliance. Included in the comprehensive surveys are:

- Condition Assessment Surveys (CAS), mentioned above, which include the Capital Assets CAS (CAS-CHAMPS) that is used (1) to determine whether buildings, equipment, and facilities have reached or exceeded their design usefulness, and (2) for the identification and reporting of deficiencies.
- Executive Safety Council Surveys.
- Surface Management Council Surveys, which address surface facility safety-related issues, including periodic field verification of area conditions.
- The Landlord Program, which ensures that DOE and OSHA requirements for safety and cleanliness of existing facilities are met; and

surface facilities are inspected each month by the landlord for adverse material conditions, radiological safety, industrial safety, and housekeeping.

- Emergency Management Department inspections for Life Safety Code requirements; these inspections are coordinated with preventive maintenance work packages. The inspection team includes personnel assigned from Industrial Safety, in accordance with WP 10-WC3008, to assist in addressing safety issues identified during the comprehensive surveys.
- Industrial Hygiene Surveys.

The S&H deficiencies that are identified by various types of aforementioned inspections and surveys, including the day-to-day observations of site personnel, are referred to as Action Requests (AR) and First Requests (FR). The AR work orders are tracked and managed via the computerized CHAMPS system. The FR deficiencies are typically corrected either on-the-spot or soon after and do not require a formal work order.

C. Routine Hazard Assessments (Self-Inspections)

The Reevaluation Team found that the site continues to successfully document hazards and track them to completion. Employee involvement was seen as a key ingredient for successful hazard assessments. All underground hazard assessment systems examined had been in place since 1989 or earlier. Each of the groups performing the inspections is trained to recognize, note, and report any hazards. The Reevaluation Team's review of inspection reports, particularly those generated by the landlord inspections, confirmed that, once noted, a hazard is tracked to correction by the cognizant landlords. Interviewed employees were very aware of the self-inspections; they regarded the self-inspections as thorough, and felt free to express any concerns or point out any hazards to the various organizations performing the self inspections.

The Industrial Safety Program procedure, WP 12-IS.01, requires a written assessment of the work site or task to be performed and approved prior to start of work in order to meet OSHA requirements. The degree of detail and rigor of the hazard assessment is appropriate to the hazard(s) and risk(s) involved, in accordance with Section X, *Graded Approach to Safety Reviews*. Documentation of the hazard assessment takes the form of a WID Safe Work Permit, JHA, HASP, work package with precautions and limitations, or other written documentation that meets the hazard assessment requirements and is appropriate for the job and hazards involved. The written hazard assessment must (1) contain a written certification that the hazard assessment has been completed that includes the identity of the workplace evaluated, the person performing the assessment, and the date of the assessment; (2) identify existing and potential hazards; (3) identify appropriate PPE; and (4) communicate the selected PPE to affected employees.

The administrative processes used to initiate a procedure or work package include the documentation that appropriate consideration has been given to hazard assessments.

Self inspections or Pre-Operational checks (Pre-Ops) are required on equipment prior to the first use of the day/shift or if the integrity of the piece of equipment is in doubt. For instance, a Pre-Op may be performed as a retest after maintenance has been performed and may be required after a casualty has occurred.

Pre-Ops normally include looking in the equipment log book for outstanding deficiencies, inspecting the equipment for foreign materials in or around the equipment, and inspecting the general condition of equipment prior to use. Additional safety checks are also performed to ensure proper functioning of vehicle horns, lights, and other safety features.

Workers clearly understood their responsibilities for safety and their roles in the safe operation of WIPP, and they appeared knowledgeable of work package hazard assessment requirements, the Industrial Safety Program requirements, and the Pre-Op checks, which they used regularly.

Because of the unique hazards posed by WIPP's extensive underground facilities, two varieties of routine hazard assessment are performed: one for surface areas, the other for underground areas.

Surface. Westinghouse performs several types of self-conducted routine hazard assessments for WIPP surface facilities. These include:

1. A daily inspection by facility operations, covering the entire facility. These inspections have been conducted since 1987.
2. Monthly inspections by facility engineers, Emergency Services technicians, and landlords. Once a month, the facility engineers cover select areas of the site, while the Emergency Services technicians cover each building. These inspections have been conducted since the inception of the site.
3. The Landlord Program has been covering all surface facilities at least quarterly for the past several years. Today the landlord program covers the entire surface area on a monthly basis. This assessment is focused primarily on S&H-related items. Currently, the surface is divided into 17 areas, each with its own cognizant landlord. The landlords are typically managers or professionals who work in the appointed area. Trained in developing checklists and recognizing hazards, they are responsible for developing a checklist in conjunction with the safety department, based on the activities, operations, and hazards in their cognizant area. Each month, the landlord completes and submits this checklist to the safety department.

   As the landlords walk around, employees are free to approach them and voice any S&H concerns. Deficiencies noted in the landlord inspection are handled by persons in the cognizant area, or, if required, entered into the work control system to be prioritized and corrected. If an item requires a significant amount of time for correction, mitigative actions are taken. Landlords have shutdown authority.
4. Safety organization inspection of all surface areas and equipment uses a risk-based scheme to determine the interval of inspection. The entire site is covered annually; high risk facilities or areas are covered quarterly.

Underground. Several kinds of routine hazard assessments are conducted underground. Performed at varying intervals, they focus on different areas:

1. Each day, personnel inspect their work areas, the equipment they use, and the grounds in which they work.
2. Daily inspections are likewise performed by Industrial Safety, Mining Operations, rovers, and Facility Operations. The Facility Operations inspections cover the entire underground area each day.
3. The entire underground area is also inspected each week by two groups from Mining Operations.
4. Heavy scaling inspections are performed approximately monthly; these, too, cover the entire underground area. Heavy scaling inspections are also performed in advance of quarterly inspections by the Mine Safety and Health Administration (MSHA)
5. Pre-MSHA inspections have recently been implemented and are performed once a month. A small team walks through the facility and conducts inspections similar to MSHA inspections.
6. Finally, an annual comprehensive and intensive inspection of the entire underground is performed by the entire Mining Operations staff.

Most of these inspections generate written reports that must be signed off by cognizant personnel. The Reevaluation Team inspected many such reports and verified appropriate sign-off.

Based on review of the inspection activities, the Reevaluation Team found that Westinghouse WID conducts comprehensive self-inspections.

D. Routine Hazard Analyses

Routine hazard analyses at WIPP are conducted in a variety of ways. Hazard analyses of non-routine onsite work are documented in process-oriented JHAs. Hazards of operating WIPP equipment are documented in equipment JHAs. Hazard analyses of routine work are a part of the site's procedures.

The Westinghouse WID JHA system was significantly upgraded to its present level of effectiveness and rigor in 1991. JHAs for both process hazards and equipment hazards are prepared according to WP 12111, *Job Hazard Analysis*, of the WIPP Safety Manual. The procedure outlines the four steps of a JHA:

1. Select a job to be analyzed.
2. Break the job into steps, activities, or phases.
3. Identify the hazard and potential accidents.
4. Develop safe job instructions.

Process type JHAs are kept with the work package for which they were developed. Equipment JHAs are used to train personnel on the equipment and are incorporated into work packages when needed.

A number of JHAs were reviewed by the team for underground operations. Recommended practices to control or eliminate the hazard were listed for each procedure step. The JHAs reviewed were complete and thorough. Tours through the site revealed no areas that had been left unaddressed in JHAs. Staff working on packages and in shops were familiar with the JHAs and the hazards associated with the work activity.

WIPP contractors are required by contract to identify and control the hazards associated with their scope of work. In 1996, a new Job Safety Hazard Analysis guide was developed for construction services and site subcontractors.

E. Employee Reports of Hazards

All employees interviewed indicated that they were strongly encouraged to express all S&H concerns freely without fear of reprisal. Review of the work controls system verified that all safety deficiencies had been corrected once reported. Interviewees felt that management followed up on their concerns and corrected deficiencies in a timely manner. Employees also indicated that they are free to write an Action Request (AR), which is then prioritized and, if necessary, entered into the work controls system for resolution.

Review of policies also revealed an open and tolerant environment for employee reporting of hazards. For example, WP 12 IS.01, *Industrial Safety Program*, states, "Every employee has the right and responsibility, without fear of reprisal from management or coworkers, to identify unsafe conditions, and if imminent danger exists, to stop work and report the hazard so the condition is corrected before proceeding." MP1.2, *Work Suspension and Stop-Work Direction*, is the policy which empowers every employee onsite to cause the stoppage/suspension of activities to prevent imminent danger. MP 4.3, *Employee Communications Policy*, states that managers are responsible for practicing the Open Door policy for resolution of any employee concern. Anonymous concerns may be submitted by utilizing the Safety Hotline or by completing an Employee Concern Form. When an employee concern is reported to Human Resources (HR), WP 15-043, *Employee Concern Procedure*, requires a response back to the employee regarding resolution of the issue within 10 working days.

Employees utilize several means to report hazards. The most common are ARs, which go to Maintenance to repair or correct unsafe conditions; reports to immediate supervisors; and reports to committee members. In addition, employees may fill out "Employee Concerns" forms which are reliably located near bulletin boards. These may be filled out anonymously for Human Resources, which receives them and oversees their resolution, and may withhold the name of the employee on request. Suggestions for safety improvements may be filed through the Process Improvement Program (PIP).

Most of the concerns which employees cannot handle themselves are reported to their supervisors. One senior mining specialist who works underground said that "nothing is postponed. If you see a problem, it gets taken care of." One employee reported a trip hazard by the front gate which required subcontracting to pour new cement. He said it was completed within a week.

Employees are provided with, encouraged to use, and do use a variety of means to notify management of safety concerns and/or get them corrected. These concerns are considered very serious, and are responded to appropriately and quickly.

F. Accident Investigations

The Reevaluation Team observed written procedures that describe an excellent accident/incident investigation system. These procedures include guidance on the reporting of incidents or events which occur at WIPP, using a root cause analysis to identify the source of the incident/event, and developing an incident/event lesson learned for dissemination to WIPP management and workers. Accident Investigations are conducted in accordance with WP 15-MD3102, *Event Investigation and Root Cause Analysis*. This procedure is initiated immediately following an identified event, i.e., any occurrence or significant deviation from planned or expected behavior that could endanger or adversely affect operations, personnel safety, property, or the environment; is contrary to regulatory requirements; or is otherwise believed to warrant investigation. In addition to investigations of events which may be considered reportables, an investigation may be conducted regarding any condition which is determined to be a Significant Condition Adverse to Quality; any condition which may not be significant by itself, but which warrants investigation to determine if it is part of a trend; and any condition the cognizant manager determines requires investigation as a matter of good business practice.

When an accident occurs at WIPP, the Facility Manager or Facility Manager Designee is held responsible for determining whether immediate corrective action is required prior to restart of continued operations. The investigation team members are chosen based upon their technical expertise in the event under investigation. In addition, they complete root cause analysis (RCA) training and are required to be independent, knowledgeable persons with no bias or vested interest in the results of the investigation.

The Team's evaluation, based on document review and random personal interviews, confirmed that Westinghouse WID continues to maintain a high quality accident/incident investigation program. The Reevaluation Team also examined fairly recent (1996-1997) incidents/events which met the criteria of DOE Order 232.1A and were reported to the Occurrence Reporting and Processing System (ORPS) database.

All incidents/events are reported to the Central Monitoring Room, which is staffed around the clock and logged in by the duty officer. The duty officer relays serious incidents or events to the Facility Manager Designee. If the incident/event meets the criteria of DOE O 232.1A, then an occurrence report is generated in ORPS. Subsequent RCA and tracking are performed, and corrective actions taken, as specified in the ORPS Order.

If the incident/event merits attention but falls short of the requirements of the ORPS Order, the incident/events RCA, tracking, and corrective action are performed more informally.

Those incidents/events which fall in either of the two categories mentioned above are investigated by a RCA team composed of exempt managers and non-exempt workers. Only individuals fully trained and qualified as team leaders may serve as the RCA team leader. Non-exempt workers can be qualified as RCA team leaders and routinely perform in this capacity.

Westinghouse WID has enhanced its Lessons Learned program. Lessons learned, both from WIPP experiences and from around DOE, are sent via hard copy to supervisors who communicate the lessons to the employees in their group. The lessons learned are provided on an Internet home page. Virtually all the employees

who were asked by the team about lessons learned indicated that they routinely received lessons learned information. All investigative reports involving reportable and non-reportable events are forwarded to the Lessons Learned Working Group. During the second quarter in 1998, the Lessons Learned Working Group reviewed approximately 900 lessons. After their review, seventeen one-page lessons learned bulletins were developed. These bulletins were distributed to the appropriate department managers for inclusion into their department's required reading programs. Interviews indicated that employees knew about the lessons learned bulletins, and the root causes of events/incidents were readily available to all employees.

G. Trend Analysis

Westinghouse WID maintains a trending program for industrial safety items. Data on injuries and illnesses, and fire protection impairments are tracked monthly, quarterly, and yearly, and communicated to employees. These reports categorize and trend various injuries to keep management informed and provide summary data for safety awareness programs. The site also has a program for employees to report hazards. As there were only 17 employee reports of hazards in the last three years, Westinghouse WID did not collectively trend these reports because analysis determined that there was no pattern for the purposes of trending.

Westinghouse provides a variety of information regarding it's RII and LWDI rates. All injuries (first aid and recordable) occurring at WIPP are broken down into four categories:

1. nature of injury,
2. body part affected,
3. type of injury, and
4. injury by task.

These categories are then charted to determine any similarities or trends.

Interviews with management personnel showed that they were cognizant of the report and were using the injury/illness data in their day to day hazard prevention activities. The Reevaluation Team reviewed records of occupational injuries distributed to management which highlighted incidents involving sprains or strains to the back muscles or shoulders. The information also documented the nature of the work that resulted in employee injury. The trends are also discussed during committee meetings and are further made visible as part of safety awareness efforts.

Facility inspections performed by Industrial Safety and Facility Operations are tabulated for trending. Inspection results are categorized into several areas, such as electrical and housekeeping. However, trending of inspection hazard data is only performed once a year.

Recommendation

The Reevaluation Team recommended that additional value may be realized by categorizing the inspection results by location and responsible section manager, or examining them zone by zone. Currently, inspection summaries are presented to management for the site as a whole.

The Reevaluation Team also recommends that Westinghouse WID revise the trend analysis of inspection hazard data so that the trending and analysis are done monthly instead of annually. ~

VI. Hazard Prevention and Control

A. Access to Certified Professionals

A variety of professional expertise is available onsite for consultation on resolution of safety issues. In addition, Westinghouse WID has access to corporate expertise in several disciplines including risk assessment, safety analysis, industrial hygiene, and others as needed.

"...we just don't get hurt here on the job..."

Safety and industrial hygiene staffing consists of four safety professionals and one industrial hygienist. Safety certification consists of one Certified Safety Professional (CSP) and two Associate Safety Professionals (ASP). The industrial hygienist is a Certified Industrial Hygienist (CIH). The medical staff consists of a Board Certified Occupational Physician and two registered nurses. One registered nurse is a Certified Occupational Health Nurse Specialist. Both of the nurses are Cardio Pulmonary Resuscitation (CPR)-certified. The nurses are supported by a substantial number of Emergency Medical Technicians (EMT) who are present during all shifts. The present staffing of S&H personnel appears to be sufficient for implementing the programs at the site.

B. Methods of Hazard Control

Westinghouse WID has developed controls to ensure protection of the public, workers, and the environment from the hazards identified at the site. A multi-layered administrative process has been institutionalized to help ensure hazards are identified and cautions and warnings are incorporated into operating procedures to mitigate the hazards. As the first step in the process, the procedure writer is directed to consider hazards when preparing a procedure and is to include a precautions and limitations section in each procedure. As the procedure is developed, cognizant individuals are required to complete a procedure checklist designed to ensure that consideration has been given to hazards which may be associated with work covered by the procedure, and the document is distributed for technical review.

Responsibility for review of work packages and procedures is assigned to experts in the Industrial Safety & Hygiene section of ES&H. As a final step in the procedure preparation process, the Document Review Committee conducts a review of the procedure. They are required to verify that applicable nuclear, radiological, and industrial safety requirements have been considered.

The Reevaluation Team found several instances where hierarchy of controls were being utilized throughout the WIPP site from substitution of less hazardous materials, such as water-based paint for solvent-based paints and detergents for solvent-based cleaners, to engineering controls, where necessary. For example, transuranic waste handling personnel noticed an ergonomic hazard during removal of the transuranic package transporters (TRUPACT) II inner container vessel lid. The lid was modified which eliminated the ergonomics hazard. In an interview, it was relayed to the Reevaluation Team that transuranic waste handling personnel noticed a hazardous condition on the dock used to open the TRUPACT II containers. Operations, craft, and engineering personnel collaborated in the design of a removable guard rail to address the hazard. The Reevaluation Team noted another example where Westinghouse WID instituted an engineering control mechanism to mitigate a hazard. In this instance, a number of personnel found that they experienced sniffling whenever they spent much time in a file room. They requested an industrial hygiene review and nurse's assistance. After testing, they found excess carpet fibers in the air. Based on employee suggestion, the maintenance group replaced the carpet with vinyl flooring,

mitigating the hazard presented by the carpet fiber.

Westinghouse has continuously improved its hazard prevention and control by integrating the involved functions into teams. They have, over the past two years, successfully pilot tested implementing Integrated Safety Management practices, including Enhanced Work Planning techniques, into Zone 3 (Electrical), and have recently expanded these practices into Zones 0, 2, 4, and part of 5 of the work site.

To foster a work environment of continual improvement, an assessment program was institutionalized in June 1997 where managers are encouraged to use a graded approach in planning assessments. The scope, frequency, and documentation is to be commensurate with the risk of the activity to workers, the environment, and the health and safety of the general public.

Deficiencies and opportunities for improvement are systematically tracked and acted upon. *Corrective Action Program* (WP 13-QA3003) provides instructions for processing, documenting, and controlling nonconforming items, material, or processes. Nonconforming items and processes that affect safety, personnel, or the environment must be corrected immediately or interim actions taken immediately to ensure the safety of personnel and the environment. Use of the Systematic Tracking and Reporting System (STAR) to track corrective action requests is a component of this program.

Westinghouse's safety culture is founded on employee involvement and strong management support. This commitment results in an administrative method for ensuring individual safety on the job. Each step involved in preparing for and accomplishing a task is analyzed for potential hazards. This identification of potential hazards then results in specific programs and requirements designed to ensure personnel safety. Personal Protective Equipment (PPE) includes devices and clothing designed to establish an effective barrier between individual personnel and harmful objects, substances, and conditions. PPE is used when it is impossible or impractical to eliminate hazards through engineering, substitution, or administrative means, or for handling emergencies.

When selecting PPE, the appropriate Material Safety Data Sheet (MSDS) is utilized as a guideline, in conjunction with the Industrial Hygienist's recommendations, to choose the correct PPE for a specific application. Repetitive tasks requiring PPE have been specifically addressed in the appropriate plans, procedures, protocols, and work orders.

Supervisors are tasked with ensuring that the required PPE is provided and properly used. Supervisors must also ensure that all personnel required to wear PPE have been adequately trained in its use and limitations.

Visitor escorts must make certain that their guests are properly attired with the required PPE for the area of visitation. The Reevaluation Team observed this first hand when visiting the mine where appropriate PPE was issued to each member. PPE is made available to all employees. Employees expressed confidence in WID's PPE program.

An effective preventive maintenance and inspection program ensures the PPE is maintained in good working condition, properly stored, and kept in a sanitary condition. It is inspected prior to each use and is cleaned and/or replaced when necessary.

Site-specific PPE requirements include but are not limited to face and eye protection, foot protection, head protection, hearing protection, respiratory protection, fall restraints, electrical protective clothing and equipment, emergency response PPE for emergency situations including fire, radiation or hazardous materials contamination, and medical emergencies.

C. Positive Reinforcement

Westinghouse management makes every effort to recognize employees for their positive contribution towards safety. Not only are appreciation letters sent by the site manager to employees for their safety accomplishments, but each year employees are also rewarded cash under the employee profit share program. In addition, Westinghouse

implements many other positive reinforcement programs, including the following award programs that recognize the contributions of employees:

- Process Improvement Program (PIP), which includes cash awards,
- Safety Fair,
- Profit Share Program,
- Giveaways for correctly answering safety-related questions,
- Safety calendars, and
- A WIPP kids safety poster.

Interviewed employees felt that management is fair in giving incentives to employees. All employees showed an awareness of the positive reinforcement programs listed above and others as well. Several employees echoed the point that they were encouraged to stop an activity if they had a safety concern, and that the focus was on getting the job done safely, not just getting the job done. Every employee interviewed who had stopped a job with a safety concern indicated that both supervisors and managers were pleased that the employee had done so, and in some cases the concern had resulted in a lesson learned that was communicated to other employees.

D. Disciplinary System

Most of the employees interviewed understood the general outlines of the disciplinary policy and knew that it is described in the Employee Handbook. Most knew that the policy included written reprimands, days off without pay, or job termination. Most employees were able to provide an example of disciplinary action for safety violations. Although employees could not give examples of managers being disciplined, they generally believed that the disciplinary treatment of the manager would be the same as that of the discipline of a worker. The Human Resources Manager, who personally handles managerial discipline, explained that there had not been a case requiring discipline of a manager for safety violations during his tenure but that other types of disciplinary cases had been acted upon. All the types of disciplinary methods—reprimands, time off without pay, and termination—can and have been used with managers.

The Reevaluation Team also noted that the random drug testing policy is applied equally to office workers and managers at all levels.

Westinghouse takes safety very seriously. Discipline for safety violations is not often necessary for employees at any level, but is handled fairly when it is necessary.

E. Preventive Maintenance

Westinghouse WID's Maintenance Operations Instruction Manual (MOIM), WP 10-2, provides instruction for maintenance work prior to beginning the work. A work order can be initiated by anyone at the site if they detect or observe a problem with a structure, system, or component. Based on the MOIM requirements, all work orders require industrial safety hazards review in the form of an attachment. This review is performed to make sure that hazards are discussed with the employees. If hazards are determined to exist, then appropriate mitigating actions are incorporated into work instructions.

If the work involves an activity or piece of equipment that has an existing JHA (such as welding and cutting operations or certain hoisting and rigging activities), the JHA is included in the work package. Packages are planned with input from planners, maintenance, engineering, safety, and crafts. Hazards that will be encountered in the work are identified in the prerequisites section and reiterated in the work instructions as CAUTION statements. Safe work practices are identified. Lockout points are recommended in the work requests and installed by operations. Maintenance personnel are given personal locking devices, which they use to overlock the operations locks. Safety energy checks are used to confirm zero energy.

Maintenance, engineering, planning, and crafts personnel participate in the development of maintenance procedures. Maintenance procedures are validated the first time the procedure is used. The Work Control Center attaches a validation form, and the procedure is performed while the planner, engineer, and others

(including safety personnel, if appropriate) observe to determine whether the procedure is adequate and practical. If the procedure cannot be performed as written, or needs changes, it is sent back to the Work Control Center, where the planner and the engineer, if need be, can revise the procedure.

Westinghouse's preventive maintenance program has continued to be highly effective since the initial DOE-VPP review. All equipment that the Team reviewed was in good working condition. Several employee and management interviews revealed that Westinghouse places strong emphasis on preventive/predictive maintenance. The Reevaluation Team verified through documentation review that all pieces of equipment under the preventive maintenance program have a thorough preventive maintenance history.

All preventive maintenance work is scheduled in accordance with regulatory requirements and manufacturer's recommendations and tracked through a consistent, computerized, site-wide work control system. Each morning, Westinghouse continues to hold a Plan of the Day (POD) meeting. This highly effective meeting documents all work occurring at WIPP during that day. Employee interviews revealed that employees frequently inquired about the status of preventive maintenance activities in their work areas.

The work prioritization process was consistently implemented across WIPP and addressed issues affecting worker safety in a highly responsive manner. Interim actions on items requiring the work control process were effective in ensuring employee safety.

F. Emergency Preparedness and Response

A hazard assessment is utilized as the foundation of the program. The assessment identifies, analyzes, and makes an assessment of the worker risks, public health and safety risks, and their consequences as a result of postulated accidents. Westinghouse conducted this hazard assessment, as required by the DOE Comprehensive Emergency Management Order (Order 151.1). Emergency planning at the WIPP site is conducted according to the requirements of Chapter 3 (Operational Emergency Base Program) of that Order. WIPP determined from the hazard assessment that the site risks are not high enough to warrant the emergency planning zones, emergency classes, protective actions, and emergency action levels covered by Chapter 4 of that Order.

Westinghouse WID provides for the continued safety of contractor personnel, visitors, and members of the general public during emergency conditions, including serious accidents or natural disasters. Preparations to manage emergency conditions include (1) minimizing the risk of personnel injury, and (2) maintaining exposure of employees, the environment, and the public to radioactive or hazardous substances and ALARA levels. Preparations have also been made to minimize facility or programmatic impacts during an emergency condition.

The Emergency Response Program at WIPP consists of three manuals: the WIPP Emergency Management Program, the Emergency Response Procedures, and the WIPP Contingency Plan.

The ES&H Emergency Management department has round-the-clock capability for response to medical, radiological, hazardous material, industrial, security, mine rescue, and natural disasters.

Westinghouse is prepared to respond to all anticipated emergencies, including underground, industrial, national security, and continuity-of-government emergencies. At the present time, Westinghouse WIPP emergency plans and procedures are in place to respond to radiological emergencies. However, because no radiological waste has yet been stored in the facility, these provisions and procedures have not yet been implemented.

Emergency Reporting and Mobilizing

Emergencies of all types are reported to the Central Monitoring Room (CMR) operator via the emergency phone number (8111) or the mine paging system. The CMR uses established procedures to determine the degree of response that the emergency requires and activates the

needed response. For very serious incidents, the Emergency Management Team can be mobilized to staff the Emergency Operations Center. For less serious occurrences, the CMR operator can direct the response of fire, medical, hazardous materials, and/or rescue teams.

Rescue Teams

In response to surface emergencies and most underground emergencies (those not involving a mine evacuation and a subsequent mine rescue team response), the on-duty emergency service technician becomes the incident commander and assumes control of the emergency response. The incident commander directs the response efforts of the responding teams that include fire, medical, hazardous materials, and rescue personnel.

Training and Equipment

PPE is available for all types of responders. Training is thorough and current. Necessary emergency equipment is staged, ready for use. Annual exercises and more frequent, smaller-scale drills are conducted to maintain training and awareness. Lessons learned from the exercises and drills are used to improve elements of the Site Emergency Plan. All personnel who were asked by the Reevaluation Team about emergency evacuation knew the procedures and the location of the accumulation area designated for the space that they occupied. Westinghouse WID designated personnel to ensure that the Reevaluation Team members or visitors could get to the appropriate accumulation area in an emergency situation. The members, however, were not informed that they had such designated personnel. The Team has made a recommendation to this point as provided at the end of this section.

Mine Rescues

Response to serious underground mine emergencies is provided by two highly trained mine rescue teams. These teams meet all requirements and criteria set by the U.S. Department of Labor, Mine Safety and Health Administration (MSHA) and have successfully demonstrated their capabilities and skills in semiannual in-mine drills as well as national competitions. The annual evacuation drill is usually conducted concurrently with one of the semiannual mine rescue team drills.

Site Emergency Plan

The WIPP Site Emergency Plan was expanded from the MSHA-required elements to its present state in 1991 in order to address all DOE and OSHA requirements as well as MSHA elements.

Based on the review of the emergency preparedness and response program, the Reevaluation Team made the following recommendation to enhance visitor safety (see Section III.G).

Recommendation

It is the Reevaluation Team's recommendation that Westinghouse review site orientation emergency preparedness procedures covering visitors to ensure successful evacuation.

G. Medical Programs

Westinghouse WID has an effective occupational health program that implements the requirements necessary for worker protection and the promotion of a healthful work environment. The program is contained in WP 12-HS.02, *Occupational Health Program Plan*. The program includes a monitored care program for review of all ill and injured employees to maximize their recovery and safe return to work, and to minimize lost time and associated costs. It also establishes and maintains a contract for an Occupational Medical Director that ensures the physician responsible for the delivery of medical services is a graduate of a school of medicine or osteopathy and meets the licensing requirements applicable to the State of New Mexico, as well as establishes and maintains a contract for a consultant pharmacist to ensure compliance with all federal and State of New Mexico drug laws.

Westinghouse WID has an active medical program that sees 25 to 45 patients each day. Two full-time nurses provide the onsite services under the direction of an occupational medical director located in Carlsbad, approximately 34 miles from the site. Twenty-seven emergency medical technicians are reported to be onsite with

a fire engine, rescue truck, and ambulance available 24 hours a day. Offsite agreements have been formalized for additional emergency medical services from the hospitals in Carlsbad and Hobbs, New Mexico.

The nurses are Advanced Cardiac Life Support Certified and are certified for pulmonary function testing by the National Institute for Occupational Safety and Health (NIOSH). Both nurses show great enthusiasm for their work and are apparently well respected by the work force, as indicated through informal interviews. One nurse is a Certified Occupational Health Nurse-Specialist. One nurse has also been certified by NIOSH for performing audiometric testing.

The Health Services facility is small but equipped with an audiometric test booth that is calibrated annually, a miniaturized spirometer that is easily transported to the field, an examination table, and instrumentation for conducting lipid profiles as part of a growing wellness program.

There is a strong rapport and coordination between the industrial hygiene (IH) staff and the nurses. The nurses receive copies of sampling results from the IH staff and often accompany them during site inspections, such as noise and ergonomic surveys.

The Health Services staff integrates with Industrial Safety and Hygiene, and Radiological Control for the purpose of identifying work-related or work site hazards and possible risks to employees, and meeting the requirements of a worker protection team, including assisting with the mitigation of work site hazards as requested. The Reevaluation Team made a recommendation to formalize the Health Services staff's participation in site hazard identification and analyses. Health Services conducts formal Job Functions and Requirements analyses to determine if jobs can be safely conducted by candidate or incumbent workers. For example, the nurses assisted in the analysis of a task involving a "batter pulley," found that the task was unsafe, and stopped the task until it was redesigned. The Occupational Health Program is integrated with the overall site emergency plan. Health Services coordinates an advanced cardiac life support program including maintenance of appropriate certifications and coordination with emergency management for integration of duties and medical protocols. The nurses regularly inspect medical emergency equipment, such as the ambulance in the mine.

The Occupational Health Program maintains an immunization program for blood-borne pathogens and a biohazardous waste program, conforming to OSHA regulations and Center for Disease Control (CDC) guidelines, for those employees at risk to these forms of exposure.

In addition, Health Services maintains the following programs: pulmonary function testing, hearing conservation program, wellness program, fitness for duty program; and coordinates the following programs: employee medical exams, substance abuse program, employee assistance program, general immunization program, exposure control program, and workers' compensation program. Health Services also maintains the Encounter Log which captures all worker illness and injury events including non work-related events, and the work-related illness and injury information. Both the Encounter Log and the illness and injury information are routinely reviewed for problems needing correction. A few events that involve the same department or same type of event are considered a sufficient trend to be analyzed since WIPP is relatively small and is committed to prevention. The illness and injury statistics are posted on the Intranet for all WIPP personnel to see. Westinghouse WID staff believe that approximately 90 percent of employees have access to computer monitors to view these statistics. More information regarding these programs may be found in the Exposure Control Plan (WP 15-HS.01), Occupational Health Program Plan (WP 15-HS.02), and in the WID Workplace Substance Abuse Plan (WP 15-HS.04).

A formal review of the occupational medical program was conducted June 15–16, 1994, by a board-certified occupational physician working for the DOE Albuquerque Operations Office. At the time of the DOE-VPP review, the site was in the

process of addressing all the concerns raised in the occupational medical program review.

Westinghouse WID has a comprehensive set of excellent medical programs. Examples include:

- Wellness Program,
- Fitness For Duty Program, and
- Hearing Conservation Program.

Though the medical personnel are involved in routine medical monitoring and other occupational safety activities, the Reevaluation Team noted that these personnel are not formally involved in Westinghouse WIPP's health and safety surveys and analyses. Accordingly, the Reevaluation Team provided the following recommendation for enhancement of the medical program.

Recommendation

It is the Reevaluation Team's recommendation that qualified medical personnel, such as doctors or nurses, be directly involved in Westinghouse's formal health and safety surveys and analyses.

H. Radiation Protection

The Reevaluation Team reviewed the implementation and design basis of the site radiological control program. Since the site has not yet begun receiving radioactive material for burial, many aspects of the radiological control program are either being implemented in a practice "demonstration" mode or are on hold pending receipt of waste material. The Reevaluation Team reviewed several site radiological control procedures; discussed the radiological control program and radiological work practices, both current and anticipated, with radiological control technicians and radiological workers; and conducted several tours of work areas. Based on this review, the Reevaluation Team found that the site generally had a well defined and implemented radiological control program established in anticipation of receipt of radioactive material for burial. The Reevaluation Team identified one notable area for improvement in the area of ensuring that radiological control staff, in particular radiological control technicians, have adequate recent actual work experience.

The Reevaluation Team reviewed the site "Radiation Safety Manual." The format and text of this manual, particularly Chapter 1 "Excellence in Radiological Control," was generally consistent with the DOE Radiological Control Manual (RCM) and reflected the recommended radiological work practices endorsed by DOE. Since the site has not yet begun receiving radioactive material for burial, the site has implemented a "demonstration" radiological control program where areas have radiological postings, radiological work permits are used, and dosimeters (TLDs and electronic alarming dosimeters) are issued. The Reevaluation Team found this to be a good initiative that reflected a strong management commitment to help prepare the workforce for implementing the radiological control program when shipments begin.

Because shipments have not yet begun, the site has not established many radiological performance goals, such as collective exposure or number of personnel contaminations. The site is planning on establishing radiological performance goals after a baseline period of one year operating experience receiving radioactive material for burial. The site has established administrative control levels (ACLs) in preparation for receipt of radioactive material for burial. ACLs are typically established to assist in maintaining exposures to ALARA and to mitigate the potential for an individual to receive an exposure in excess of a regulatory limit.

The ACL for radiological workers is 1000 millirem. Although this value is well below the regulatory exposure limit in 10 CFR 835, *Occupational Radiation Protection*, it appeared that it would be possible to establish a more challenging ACL. For comparison purposes, the average annual exposure for individuals with measurable radiation exposure at DOE facilities is below 80 millirem. The Radiological Control Manager stated that after the site has experienced a period of time receiving radioactive material they would be able to evaluate the levels of personnel exposure and then develop challenging ACLs. The Reevaluation Team recommends that the site establish lower, challenging ACLs and, if future operating experience requires, raise the ACLs as necessary.

The Reevaluation Team also noted that the ACLs for declared pregnant workers, minors, and members of the public were set equal to the corresponding regulatory limit. The Radiation Safety Manual discusses the necessary approvals to exceed these levels. The Reevaluation Team found this to be confusing since these ACLS are already set at the regulatory limit and there should not be a process to exceed these limits. The Team recommends that appropriate ACLs be established for these categories of individuals.

All of the individuals interviewed were aware of the different employee concerns programs and most were involved in the review of work procedures. All individuals indicated that their concerns and comments were adequately addressed.

The Reevaluation Team attended an ALARA Committee meeting. The ALARA Committee consisted of a good cross section of representatives from different work organizations and employee categories. The topics discussed during the meeting appeared to be appropriate for a site preparing to begin radiological operations. The Team found the initiation of the ALARA Committee well before receipt of radioactive material for burial to be proactive. The Team feels that it will assist in establishing the ALARA process when shipments begin.

The Reevaluation Team reviewed selected procedures from the site "Operational Health Physics Procedures Manual" and discussed their implementation with members of the radiological control organization. Generally, the Team found the radiological control program to be prepared for receipt of radioactive material for burial. For example, the dosimeter processing used onsite is already accredited by DOELAP and the radiochemistry laboratory participates in intercomparison programs with other laboratories. The Team noted, however, one area where further worksite analysis would improve the program. Many of the operational health physics procedures discuss evaluating radiological conditions using the derived air concentration (DAC) values for strontium 90 for beta emitters and plutonium 239 for alpha emitters. The rationale for using the values for these radioisotopes is that these are anticipated to be the predominant radionuclides in the receipt shipments. Although the DAC for plutonium 239 is restrictive, it is not the most restrictive DAC value. Using a default DAC value for plutonium 239 should be sufficient for the majority of anticipated shipments. However, it may result in the underestimation of airborne radioactivity concentrations for shipments that contain significant quantities of radioisotopes with a more restrictive DAC value. The Reevaluation Team recommends that the site provide procedural guidance on the evaluation of samples if shipments are received with components of radioisotopes with a more restrictive DAC than the default DAC.

The Reevaluation Team noted that the radiological control program has ready access to Certified Health Physicists (CHPs). There are two CHPs within the ES&H organization. In addition, two of the technicians in the operational health physics group are certified by the National Registry of Radiation Protection Technologists (NRRPT). The Team considers this to be a positive attribute. There are currently five technicians within this group and the site plans on gradually augmenting the staffing level to 17 technicians.

During site tours, the Reevaluation Team noted that the daily quality control response checks and background checks for the counting equipment in the count room were very good. There were well defined criteria for acceptable background count levels and acceptable response check counts. The daily values were plotted on control charts to trend the equipment's status. The Team noted that the daily quality control response checks and background checks for the counting equipment used in the Transuranic Package (TRUPAC) Maintenance Facility were not as rigorous. There was no defined acceptable range for response checks or background levels and there were no control charts. This equipment will be used to count air samples from the opening of the TRUPACs and the Team recommends that this equipment have a more rigorous daily check, similar to the count room equipment.

The Team reviewed the radiological protection training provided to general employees, radiological workers, radiological control technicians, and other radiological control support personnel, such as the individuals who work in the dosimetry office. The site utilizes the standardized radiological control training developed and issued by DOE for General Employee Radiological Training, Radiological Worker Training (I and II), and Radiological Control Technician Training. Discussions with several employees indicated that they believed they were being provided with the appropriate level of radiological protection training.

During discussions with waste handlers, the Team noted that the site had sent these individuals to another DOE site to gain actual work experience with material contaminated with plutonium. Some of these individuals had little or no other experience in actual radiological work environments and the Team found this initiative to be a positive action to help address the lack of real work experience for these individuals. The site should continue to provide this type of actual work experience whenever possible.

The Team noted that most of the Radiological Control Technicians had been employed at the site for many years. Some of these individuals had little or no experience working in other radiological facilities prior to working at the site. With the exception of some experience working with the sealed radioactive sources, work experience for the Radiological Control Technicians at the site has been primarily working in simulated radiological work environments. Two of the Radiological Control Technicians had spent two weeks earlier this year working at another DOE site with the waste handlers as discussed previously. The Team found this initiative to be a positive action. However, the Team believes that further actions need to be taken to address both the lack of recent experience and the lack of practical work experience in radiological environments for the Radiological Control Technicians.

Recommendation

It is the Reevaluation Team's recommendation that the following strategies be implemented:

- Establish lower, more challenging ACLs for radiological workers and establish appropriate ACLs for minors, members of the public, and declared pregnant workers.
- Provide procedural guidance on the evaluation of samples in shipments received with significant quantities of radioisotopes, which have a more restrictive DAC value than the default DAC being used.
- Implement a more rigorous daily check of the counting equipment used in the TRUPAC Maintenance Facility, similar to that used for the count room equipment.
- Develop a plan to ensure that the Radiological Control Technicians have recent and practical work experience in radiological environments, such as providing rotational assignments at other nuclear sites. ~

VII. Safety and Health Training

Westinghouse WID has continued to maintain an excellent training program with a dedicated training facility and a highly qualified training staff. The facility has five classrooms, two laboratories, and a studio designed for developing interactive videos. The training program for employees, visitors, and subcontractors is a formally organized and continuing program. Westinghouse WID uses Systematic Approach to Training (SAT) where jobs are analyzed by a team of subject matter experts, engineers, employees, supervisors, other experts as applicable, and training staff; and program curriculum and contents are developed. The systematic approach reasonably assures that tasks essential to safe operation are addressed by the training program.

Managers are responsible for the training needs of their employees. However, new employees are given a 1-day orientation, followed by 2 days of General Employee Training (GET). Fourteen general topics are covered in GET. Twelve hours of GET cover safety-related topics, such as hazard communication, ladder safety, electrical safety, and so forth. In addition, employees who are assigned to operate a piece of equipment are required to undergo qualification card requirements. The qualification card is divided into four areas: equipment knowledge, equipment safety, equipment maintenance, and equipment practical. Employees must demonstrate proficiency in these areas before operating a given piece of equipment.

The reevaluation and interviews of employees revealed no specific patterns or problems that might affect the S&H training program. Employees reported that safety training helps them understand the potential hazards of their jobs and ways to protect themselves. Top management fully supports the training program, as evidenced by interviews with employees and supervisors, funding levels, and reviews and approvals on training documentation.

Several of the safety courses developed by the site are required by Federal and State regulations; others come from supervisory job and task analyses. Training is completed in a setting that can be formal (held in a classroom) or job-specific (typically on-the-job training).

Training courses are updated continually using feedback furnished by the student's supervisor or manager. Also, supervisors and employees are sometimes used as subject matter experts. After receiving 40 hours of instructor training, they are qualified to serve as on-the-job trainers. The Training Department is also responsible for issuing and maintaining formal certifications, such as hoisting and rigging, lockout/tagout, and permitted confined space. Subcontractors are included in the same elements of the safety training programs as WID employees and are given courses relevant to the work they are performing. Employees reported that safety training helps them understand the potential hazards of their jobs and ways to protect themselves.

Training is recorded in a computer database and backed up by hard copies. To verify the accuracy of an employee's training record, the Reevaluation Team requested the training record of a randomly selected employee from the operations group. It was noted that the training record was kept up to date. The computer program is a state-of-the-art system and fulfills all the site's documentation needs. For example, the system provides employees and supervisors with a quarterly updated history of their training. A monthly calendar of classes is also published and distributed to managers, supervisors, and hourly employees.

Top-level managers and supervisors are required to take a self-paced training course called MAST. They also participate in another program called Supervisor Training and Accident Reduction Techniques (START). Safety and health training for radiation workers includes radiation training, levels one and two. The site course was designed to match DOE's radiation core course and follows

its curriculum elements. In 1993, 284 radiation workers were trained.

From interviews, it was established that employees knew how to protect themselves and others from job hazards. Employees were also observed using PPE. When questioned about their use of PPE, they were knowledgeable about its limitations and care. The employees could also explain in detail what their responsibilities would be for different types of onsite emergencies. ~

VIII. General Assessment

A. Safety and Health Conditions

The Reevaluation Team conducted a number of walkarounds, both as a group and individually, and conducted over one hundred interviews of personnel. The consensus of the Team was that the site was exceptionally well maintained and no major issues of non-compliance with DOE orders or safety and health standards were discovered.

B. Safety and Health Programs

The Reevaluation Team found the Westinghouse WID safety and health program to be highly effective. While minor opportunities for improvement were identified, the overall program is comprehensive and well communicated. ~

IX. Recommendation

It is the unanimous recommendation of the Reevaluation Team that Westinghouse WID at WIPP be recertified into the DOE-VPP at the STAR level. ~

Appendix: DOE-VPP Reevaluation Team for Westinghouse WIPP

Name	Organization	Area(s) of Responsibilities
KANTH, Sanjeeva	Team Leader, DOE/EH-51	**Management Leadership/Safety and Health Training** Commitment, Responsibility, Line Accountability, Visible Management Involvement, Records Review, RII and LWDI Rates, Safety and Health Training, Subcontractor Programs
COFFMAN, Carlos	DOE/EH-51	**Worksite Analysis** Self Inspections, Preventive Maintenance, Pre-use/Pre-startup Analysis, Accident Investigations, Trend Analyses, Job Hazard Analyses, Hazard Tracking
O'CONNELL, Peter	DOE/EH-52	**Radiation Protection**
RICHARDSON, Peggy	Consultant	**Employee Involvement** Employee Involvement, Employee Reports of Hazards, Disciplinary System, Program Evaluation
LAWSON, Bruce	East Tennessee Technology Park (ETTP)/Oak Ridge, OCAW Representative	Employee Involvement, Employee Reports of Hazards, Disciplinary System
WEITZMAN, David	DOE/EH-51	**Hazard Prevention and Control** Comprehensive Surveys, Access to Certified Professionals, Methods of Hazard Control, Medical Programs, Positive Reinforcement, Site Orientation, Emergency Preparedness